1 Experiment Overview

You are about to participate in an experiment in the economics of decision making. If you listen carefully and make good decisions, you could earn a considerable amount of money that will be paid to you in cash at the end of the experiment.

You have been paired with four other individuals in the room. In each period, each of you will be given an amount of cash, denominated in francs. This will be denoted by the letter E, for "Endowment." Your group will participate in a process in which the level of some good Y will be chosen by the collective decisions of your group members. Each of you has a value for Y that depends on how much Y is chosen by your group. This will be called $V(Y)$. You may not have the same value for a given level of Y as anyone else in your group. Furthermore, your decision in the process may result in you being charged some number of francs T. This number T may be determined by your decision, the decisions of the others in your group, and the level of Y chosen by your group.

At the end of each period, you will be paid for the number of francs you have earned for the period, which is equal to your value for Y plus your initial endowment of francs minus the amount T that you paid. Mathematically, you will be paid based on

$$earnings\ in\ francs = V(Y) + E - T$$

At the end of the experiment, your total earnings in francs will be converted to dollars using a pre-specified exchange rate, which will be told to you by the experimenter.

The rules for the experiment are as follows. No talking or communicating with other participants. If you are using a computer, do not use any software other than that explicitly required by the experiment. Feel free to ask questions by raising your hand or signalling to the experimenter.

The process will now be explained in detail.

2 The Process

The process through which your group will choose the level of Y is as follows. Each of you will choose how many units of Y you would personally like to add to the total. For example, let person 1 choose $A1$, person 2 choose $A2$, and so on. At the end of the period, the total level of Y will be given by

$$Y = A1 + A2 + A3 + A4 + A5$$

In each period, each person can add anywhere from -4 to 6 units of Y. You may add "partial" units, such as 3.45 units, for example. A negative addition implies that you want to take units away from the total of Y.

The payment each person must make is dependent upon the average of the other 4 additions and the variance of those other 4 additions. Specifically, let

S be the average of the other 4 messages and V be the variance of the other 4 messages. For person 2, these would be calculated by the formulas

$$S_2 = \frac{A1 + A3 + A4 + A5}{4}$$
$$V_2 = \frac{(A1 - S_2)^2 + (A3 - S_2)^2 + (A4 - S_2)^2 + (A5 - S_2)^2}{3}$$

Roughly speaking, V measures how "spread out" the other 4 messages are.

The payment each person must make is as follows. First, we calculate the total cost of Y per person. Each unit of Y costs 100 francs, so the total cost is $100 * Y$ francs. This is then divided equally among the 5 people, so the cost per person is $(100 * Y)/5$. Second, we calculate the additional payment each person must make based on their S and V. This extra payment is determined by how far away your addition is from the average of everyone else's and on the variance of everyone else's messages. Putting it all together, if a person adds A units to the level of Y, then the payment each person must make is given by

$$T = \left(\frac{100\ Y}{5}\right) + \left(40\ \ (A - S)^2 - 50\ V\right)$$

Note that if V were large and $(A - S)$ were small, then the second half of your payment could be negative. This means that you may end up paying more or less than 1/5 of the total cost, and this all depends on your decision and the decisions of the others in your group.

At the end of the period, the total level of Y will be given by $Y = A1 + A2 + A3 + A4 + A5$ and you will earn $V(Y) + E - T$.

This process is computerized. In each period, you will input your decision into a computer program that will calculate Y and determine your payment and your earnings based on the decisions of your group. The computer will also keep track of your earnings and the results of all previous periods for your reference. The computer interface includes a tool called the "What-If Scenario Analyzer." This is a special calculator adapted to help you figure out how much you would earn in certain hypothetical scenarios. It allows you to enter values of S, V, and A just to see what you would earn if that was the real outcome of the period. Feel free to use this tool to help you make decisions. If you have any questions about the computer interface at any time, please raise your hand.

Questions?